elongated body overlapping and extending parallel to the plane surface and perpendicular to the edge, and

wherein the elongated body comprises a silicon cantilever having a doped resistive region formed therein.

REMARKS

These remarks follow the order of the paragraphs of the office action. Relevant portions of the office action are shown indented and italicized.

DETAILED ACTION

The drawings are objected to because there snot Figure 19 (Two different figures are labored Figure 17). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended". If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either Replacement Sheet or New Sheet pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

In response, the applicants respectfully state that sheet 10 of the drawings is amended to correct the figure number from Fig. 17 to Fig. 19. It is marked 'Replacement Sheet".

The disclosure is objected to because of the following informalities: The sentence on p.16, lines 3-6 from bottom of the page, is missing material.
Appropriate correction is required.

In response, the applicants respectfully state that a typographic error on Page 17, lines 3-6, of the specification is corrected herewith. This is included in the paragraph starting on Page 16, line 22.

Serial No.: 10/526,052

On p. 17, Figure 26 is not a "composite" (p. 17, line 4) of Figures 24, 25. One, two or all three of those figures are in error.

In response, the applicants respectfully state that sheet 13 of the drawings is amended to correct the graph of Fig. 26 to be a composite. It is marked 'Replacement Sheet". A complete set of drawings including the two replacement sheets accompanies this amendment.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In response, the applicants respectfully state that they believe that Claims 1-16 are allowable under 35 U.S.C. 112, second paragraph as being definite and particularly point out and distinctly claiming the subject matter which applicant regards as the invention.

As to claim 1, how does an article describe ("describes") movement? Should "describes" read - undergoes --2 Is there some special meaning for the term "describes"?

In response, the applicants respectfully state that in order to satisfy the request in the office communication, claim 1 is amended to change the word "describes" to read "undergoes". This certainly overcomes the rejection under 35 U.S.C. 112, second paragraph of Claims 1-16, which are allowable.

Claims 1-5,7,8,14,15,16,17,18,19 are rejected under 35 U.S.C. 102(b) as being anticipated by Abraham et al.

In response, the applicants respectfully state that the inventions in Claims 1-5, 7, 8, 14, 15, 16, 17, 18, 19 are apparently not anticipated by Abraham. The invention claimed, is for, "[A] transducer for detecting movement of an article mounted for movement in a plane, the transducer comprising: a heater facing the plane of movement of the article and having a temperature dependent resistance; and, an edge defined in the article between regions of different thermal conductivity; wherein, as the article describes the movement, the edge moves relative to

the heater producing a corresponding variation in heat loss from the heater and a corresponding variation in resistance of the heater."

Whereas, the cited art to Abraham is entitled, "Thermal Proximity Imaging of Hard Substrates." The abstract of Abraham reads, "[W]e discuss a new measurement technique called thermal proximity sensing (TPS) and its application to the inspection of magnetic hard-disk surfaces. This method used the magneto-resistive (MR) readback element of a hard-disk file in a novel thermally sensitive mode to actively sense the air-bearing gap spacing while the disk spins under the slider. We present model calculations that describe the origin of the thermal sensitivity and its range of applicability. By collecting height information as a function of position, we have obtained high resolution images of a disk topography with sensitivity in the subnamometer range. Initial results of the technique, obtained on a test stand, showed an exceptional imaging ability for surface features. We have also obtained useful surface structure data from in situ measurements of disk surface defects in an operating hard-disk file." Thus Abraham is not concerned with a "transducer for detecting movement of an article mounted for movement in a plane," as are Claims 1-5, 7, 8, 14, 15, 16, 17, 18, 19.

> *As to claims 1-5,14,17,18, Abraham et al teach (Figure 2) a system, including: spinning disk (article); heater head whose resistance varies with temperature (p. 3998, left hand col.); an edge defined between the flat top surface of the article and either the bump or pit; wherein, as the article undergoes movement the edge moves relative to the heater producing a variation in heat loss from the heater and the corresponding variation n resistance of the heater.*

In response, the applicants respectfully state that claim 1 reads,

> "A transducer for detecting movement of an article mounted for movement in a plane, the transducer comprising:
>
> the article;
>
> a heater facing the plane of movement of the article and having a temperature dependent resistance; and

an edge defined in the article between regions of different thermal conductivity; wherein, as the article undergoes the movement, the edge moves relative to the heater producing a corresponding variation in heat loss from the heater and a corresponding variation in resistance of the heater."

Abraham is not concerned with "detecting movement of an article mounted for movement in a plane," or with the steps for detecting. Abraham is in regard to the inspection of magnetic hard-disk surfaces, not edges or edge measurements. A review of the cited portion of Abraham (p. 3998, left hand col.) shows paragraphs on theory upon which Abraham's paper is based. Abraham discusses MR 'temperature at the 'head under bias conditions', and 'heat flow out of the [MR] head and into the surrounding environment ... ." This does not refer to a 'heater' element "facing the plane of movement of the article and having a temperature dependent resistance." This is not related to an magneto-resistive (MR) readback element of a hard-disk file, as is Abraham. Also, reference in Abraham to "pits or bumps on the disk surface," are certainly not concerned with "an edge defined by the article," where the Abraham's article defined by the office communication is Abraham's 'spinning disk'. An edge is not a pit or a bump and is not on a surface. A pit or a bump is certainly not "an edge defined in the article between regions of different thermal conductivity," as is the edge of claim 1. Furthermore, since there is no heater element in Abraham, there is no variation in heat loss of a heater, and certainly not "a corresponding variation in resistance of the heater." Also, there is certainly not, "an edge defined in the article between regions of different thermal conductivity; wherein, as the article undergoes the movement, the edge moves relative to the heater producing a corresponding variation in heat loss from the heater and a corresponding variation in resistance of the heater." Thus, Abraham does not have all the elements of claim 1, which is allowable over the cited art. Thus, claim 1 and all claims that depend on claim 1 are allowable over the cited art.

Claim 2 reads,

"A transducer as claimed in claim 1, wherein the article is mounted for translational movement in the plane."

Abraham's 'article' defined by the office communication is Abraham's 'spinning disk', apparently has no indication of being "mounted for translational movement" in a plane. Thus claim 2 is allowable over Abraham for itself and because it depends on allowable claim 1.

Claim 3 reads,

> A transducer as claimed in claim 2, wherein the edge is located in a plane surface of the article.

Abraham's 'article' defined by the office communication is Abraham's 'spinning disk', apparently has no indication of having and using an edge "located in a plane surface of the article". Thus claim 3 is allowable over Abraham for itself and because it depends on allowable claim 1.

As to claims 4,19, note the shape of the grids in Figure 9.

In response, the applicants respectfully state that Claim 4 reads,

> "A transducer as claimed in claim 3, wherein the edge is rectilinear."

Abraham's 'article' defined by the office communication is Abraham's 'spinning disk', apparently has no indication of having and using an edge that "is rectilinear." This is apparently not related to "the shape of the grids in Figure 9," cited above. Thus claim 4 is allowable over Abraham for itself and because it depends on allowable claim 1.

Claim 19 depends on claim 18 which depends on claim 17. Claims 17-19 read,

> 17. A method for detecting movement of an article mounted for movement in a plane, the method comprising: locating a heater having a temperature dependent resistance to face the plane of movement of the article; defining an edge in the article between regions of different thermal conductivity; and, detecting variation in resistance of the heater corresponding to variation in heat loss from the heater as the edge moves relative to heater during movement of the article in the plane.
>
> 18. (previously presented) A method as claimed in claim 17, wherein the edge is located in a plane surface of the article.

19. (previously presented) A method as claimed in claim 18, wherein the edge is rectilinear, and wherein the heater comprises an elongated body overlapping and extending parallel to the plane surface and perpendicular to the edge.

As discussed with regard to claim 1, similarly regarding claim 17, Abraham is not concerned with "detecting movement of an article mounted for movement in a plane," or with the steps for detecting. Abraham is in regard to the inspection of magnetic hard-disk surfaces, not edges or edge measurements. A review of the cited portion of Abraham (p. 3998, left hand col.) shows paragraphs on theory upon which Abraham's paper is based. Abraham discusses MR 'temperature at the 'head under bias conditions', and 'heat flow out of the [MR] head and into the surrounding environment ... ." This does not refer to a 'heater' element "facing the plane of movement of the article and having a temperature dependent resistance." This is not related to an magneto-resistive (MR) readback element of a hard-disk file, as is Abraham. Also, reference in Abraham to "pits or bumps on the disk surface," are certainly not concerned with "an edge defined by the article," where the Abraham's article defined by the office communication is Abraham's 'spinning disk'. An edge is not a pit or a bump and is not on a surface. A pit or a bump is certainly not "an edge defined in the article between regions of different thermal conductivity," as is the edge of claim 1.. Furthermore, since there is no heater element in Abraham, there is no variation in heat loss of a heater, and certainly not "a corresponding variation in resistance of the heater." Also, there is certainly not, "an edge defined in the article between regions of different thermal conductivity; wherein, as the article undergoes the movement, the edge moves relative to the heater producing a corresponding variation in heat loss from the heater and a corresponding variation in resistance of the heater." Thus Abraham does not have all the elements of claim 17, which is allowable over the cited art. Thus all claims that depend on claim 17 are allowable over the cited art.

Abraham's 'article' defined by the office communication is Abraham's 'spinning disk', apparently has no indication of having and using an edge "located in a plane surface of the article". Thus claim 18 is allowable over Abraham for itself and because it depends on allowable claim 17.

Abraham's 'article' defined by the office communication is Abraham's 'spinning disk', apparently has no indication of having and using an edge that "is rectilinear." This is apparently not related to "the shape of the grids in Figure 9," cited above. Thus claim 19 is allowable over Abraham for itself and because it depends on allowable claim 1.

As to claims 5,7,19, the heater will overlap, and have its bottom surface parallel to the top, planar surface of the disk at some time.

In response, the applicants respectfully state that claim 5 reads,

> 5. A transducer as claimed in claim 4, wherein the heater comprises an elongated body overlapping and extending parallel to the plane surface and perpendicular to the edge.

Abraham's 'article' defined by the office communication is Abraham's 'spinning disk', apparently has no indication of being or having a "heater comprises an elongated body overlapping and extending parallel to the plane surface and perpendicular to the edge." Thus claim 5 is allowable over Abraham for itself and because it depends on allowable claim 1.

No rejection is stated for claim 6. So claim 6 must be allowed. Claim 6 reads

> 6. (previously presented) A transducer as claimed in claim 5, wherein the elongated body comprises a silicon cantilever having a doped resistive region formed therein.

Abraham's 'article' defined by the office communication is Abraham's 'spinning disk', apparently has no indication of being or having a "heater comprises an elongated body overlapping and extending parallel to the plane surface and perpendicular to the edge," or concerned with or reference to a "elongated body comprises a silicon cantilever having a doped resistive region formed therein." Thus claim 6 is allowable over Abraham for itself and because it depends on allowable claim 1.

Claim 7 reads,

> 7. (previously presented) A transducer as claimed in claim 5, wherein the edge is located on the periphery of the plane surface.

Serial No.: 10/526,052

Abraham's 'article' defined by the office communication is Abraham's 'spinning disk', apparently has no indication of having and using an edge "located on the periphery of the plane surface." Thus claim 7 is allowable over Abraham for itself and because it ultimately depends on allowable claim 1.

Applicants fail to understand the relevance or any back-up for office communication's statement above, "[A]s to claims 5, 7, 19, the heater will overlap, and have its bottom surface parallel to the top, planar surface of the disk at some time." Relevance and back-up are respectfully requested for this office communication's statement. Even if this were so, this does not anticipate and is not the invention in claims 5, 7, 19. Thus, claims 5, 7, 19 are allowable for themselves and because each depends on an allowable claim.

As to claim 8, note the bump in Figure 2.

In response, the applicants respectfully state that claim 8 reads,

> 8. A transducer as claimed in claim 5, wherein the edge is formed as a step in the plane surface.

Applicants fail to understand the relevance of noting "the bump in Figure 2," stated above. The limitation in claim 8 which ultimately depends on claims 1, 4 and 5, is not related to an magneto-resistive (MR) readback element of a hard-disk file, as is Abraham. Also, reference in Abraham to "pits or bumps on the disk surface," are certainly not concerned with "an edge defined by the article," where the Abraham's article defined by the office communication is Abraham's 'spinning disk'. An edge is not a pit or a bump and is not on a surface. A pit or a bump is certainly not an edge "formed as a step in the plane surface," as is the edge of claim 8. Thus claim 8 is allowable over Abraham for itself and because it depends on allowable claim 1.

As to claim 15, there is a slot between each of the 18 fines in Figure 9.

In response, the applicants respectfully state that claim 15 reads,

> 15. (original) A transducer as claimed in claim 14, wherein the edge is in the form of a side of a slot formed in the surface and extending radially from the axis of the rotation.

Applicants fail to understand the relevance to the limitation in claim 15, or any back-up, for office communication's statement above, "[A]s to claim 15, there is a slot between each of the 18 fines in Figure 9." Reference in Abraham to "pits or bumps on the disk surface," are certainly not concerned with "an edge defined by the article," where the Abraham's article defined by the office communication is Abraham's 'spinning disk'. An edge is not a pit or a bump and is not on a surface. A pit or a bump is certainly not an edge "in the form of a side of a slot formed in the surface and extending radially from the axis of the rotation," as is the edge of claim 15. Thus claim 15 is allowable over Abraham for itself and because it depends on allowable claim 1.

As to claim 16, each one of the lines 18 of Figure 9 is shaped like a spoke.

In response, the applicants respectfully state that claim 16 reads,

16. (original) A transducer as claimed in claim 14, wherein the surface comprises a spoke extending radially from the axis of rotation and the edge comprises a side of the spoke.

As said above, the reference in Abraham to "pits or bumps on the disk surface," are certainly not concerned with "an edge defined by the article," where the Abraham's article defined by the office communication is Abraham's 'spinning disk'. An edge is not a pit or a bump and is not on a surface. A pit or a bump is certainly not an edge used in a limitation "wherein the surface comprises a spoke extending radially from the axis of rotation and the edge comprises a side of the spoke," as is the edge of claim 16. Applicants fail to understand the relevance to the limitation in claim 16, and request back-up, for office communication's statement above, "[A]s to claim 16, each one of the lines 18 of Figure 9 is shaped like a spoke." According to the legend for Abraham Fig. 9, the shape of the lines in Fig 9 is to "provide a grid of height and widths for TPS studies." This has nothing to do with spokes, and certainly with spokes that have an edge that "comprises a side of the spoke." Thus claim 16 is allowable over Abraham for itself and because it depends on allowable claim 1.

Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Serial No.: 10/526,052

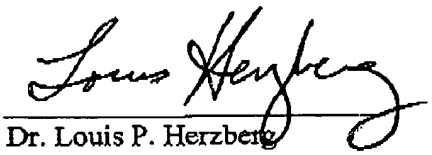
In response, the applicants respectfully state that although claim 20 should be allowable as is because it depends on claims not anticipated by the cited art, claim 20 is amended to have all the limitations of claims 17-19 upon which it depends.

No rejection is stated for claims 6 and 9-13. So claim 6 and 9-13 must be allowed over the cited art.

It is anticipated that this amendment brings the allowance of claims 1-20. In the event that any question remains, please contact the undersigned before issuing an office communication having a FINAL status.

Please charge any fee necessary to enter this paper to deposit account 50-0510.

Respectfully submitted,

By: 

Dr. Louis P. Herzberg
Reg. No. 41,500
Voice Tel. (845) 352-3194
Fax. (845) 352-3194

3 Cloverdale Lane
Monsey, NY 10952

Customer Number: 54856